experience more health problems and therefore are more attuned to the need for medical research.[23]

In the past few years, the pattern has been less distinct. Now, all that can be said about the relationship between age and attitudes is that the 18- to 24-year-old age group is the *only* age group in which a majority opposes the use of dogs and chimpanzees in scientific research. (See figure 8-15.)

It is noteworthy that, for each age group, men are significantly more likely than women to support animal research. In no age group does a majority of women support the use of dogs and chimpanzees in scientific research.

Use of Computers and Computer Technology in the United States

There has been a marked increase in the number and variety of sources providing information about science and technology. (See chapter 9, "Significance of Information Technologies" and sidebar "Where Americans Get Information About Science and Technology.") Computers and computer technologies have become important in facilitating access to these new sources of information. According to the 1999 NSF survey, just over one-fifth of American adults have searched for science- or health-related information on the World Wide Web.

A number of indicators show the growing and widespread use of computers and computer-based technologies in the late 1990s. The increase in the number of home computers is particularly noteworthy.[24] In 1999, for the first time ever, a majority of American adults (54 percent) had at least one computer in their homes. The percentage has been rising steadily since 1983, when only 8 percent had them. (See figure 8-16 and appendix table 8-30.) In addition, among all adults,

- 46 percent had modems (for connection to the Internet) in their home computers, up from 21 percent in 1995;
- 45 percent had CD-ROM readers, up from 14 percent in 1995;
- 32 percent subscribed to an on-line service and had home e-mail addresses, up from 18 percent in 1997; and
- 17 percent had more than one computer in their homes, up from 12 percent in 1997. (See figure 8-17 and appendix table 8-31.)

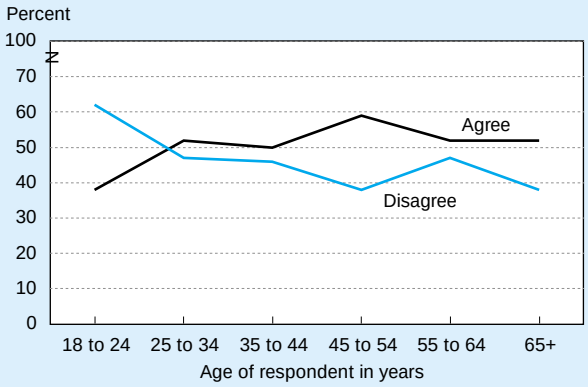
The average amount of time spent per year using a home computer rose from 103 hours in 1995 to 153 hours in 1999.

[23]It should be noted that the survey data are cross-sectional, rather than longitudinal. Although it can be assumed that, as adults age and experience more health problems, they become more receptive to the use of animals in scientific research, it is also possible that the older adults who participated in the survey have always been—throughout their lives—more supportive of animal research than the younger participants in the survey. Likewise, it is also possible that the current group of younger adults who participated in the survey will retain their higher level of opposition as they age.

One of the reasons for the high level of opposition to animal research among young adults is that animal rights groups, which distribute brochures to schools and use young celebrities to promote their cause, have been successful in influencing young people, especially girls. One study found that factors beyond educational achievement and science literacy, for example, a strong emotional component, account for the strong opposition among young women. Interestingly, this study revealed that the level of science achievement among girls who opposed animal research was higher than that for girls who favored animal research (Kimmel Pifer 1994).

[24]In a poll conducted in 1996, 43 percent of the respondents said they were very interested, and another 33 percent said they were somewhat interested, in learning more about computers. Among this same group of respondents, 45 percent thought that home computers would make it easier to do things like shopping, paying bills, making travel arrangements, and looking things up electronically instead of going to a library or buying books or newspapers; 16 percent thought using a computer would make doing these activities more complicated (Roper 1996).

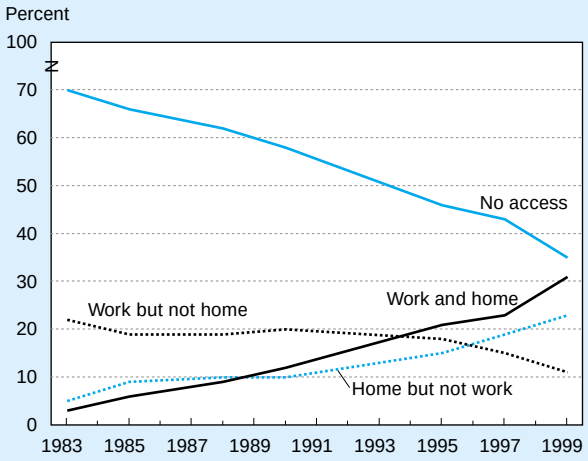
Figure 8-15.
U.S. public support for the use of dogs and chimpanzees in scientific research: 1999



NOTE: Responses are to the following question: "Scientists should be allowed to do research that causes pain and injury to animals such as dogs and chimpanzees if it produces new information about human health problems. Do you strongly agree, agree, disagree, or strongly disagree?"

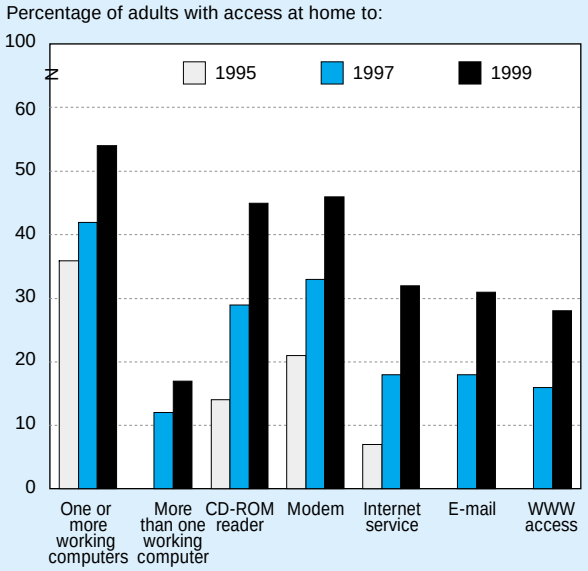
See appendix table 8-28. *Science & Engineering Indicators – 2000*

Figure 8-16.
Public access to computers: 1983–99



See appendix table 8-30. *Science & Engineering Indicators – 2000*

Figure 8-17.
Home access to computers: 1995, 1997, 1999



See appendix table 8-31. *Science & Engineering Indicators – 2000*

(See appendix table 8-32.) This increase, however, is almost entirely attributable to growth in the number of home computers. The average amount of time each person spends using his or her home computer remained relatively stable during the late 1990s, around 300 hours per year. (See figure 8-18.) However, a shift occurred in how that time was spent. More time is being spent on the Internet and less on other activities, for example, word processing. Among all home computer users, the amount of time spent on the Internet increased more than tenfold between 1995 and 1999 (from 15 hours per year to approximately 160). In addition, for those with Internet access, the amount of time spent on Internet activities, including using e-mail and visiting Web sites, increased from an average of 80 hours in 1995 to 269 hours in 1999. (See figure 8-18.)

The number of people with access to a computer at work has also been climbing, but the increase has been less dramatic. In 1983, one-fourth of the NSF survey respondents reported using a computer at work, and about one-third said they did in 1990. The proportion was up to 42 percent in 1999. (See figure 8-16 and appendix table 8-30.) In addition,

- Twenty percent of those surveyed had e-mail addresses at work, up from 16 percent two years earlier (see appendix table 8-31).
- The average amount of time spent using a computer at work increased 17 percent between 1995 and 1999, to about 950 hours per year. (See figure 8-18 and text table 8-5.)

The number of people *without* access to a computer either at home or at work fell between 1983 and 1999—from 70 percent down to 35 percent. In 1999, for the first time, there was no gender gap in lack of access. (See appendix table 8-30.)

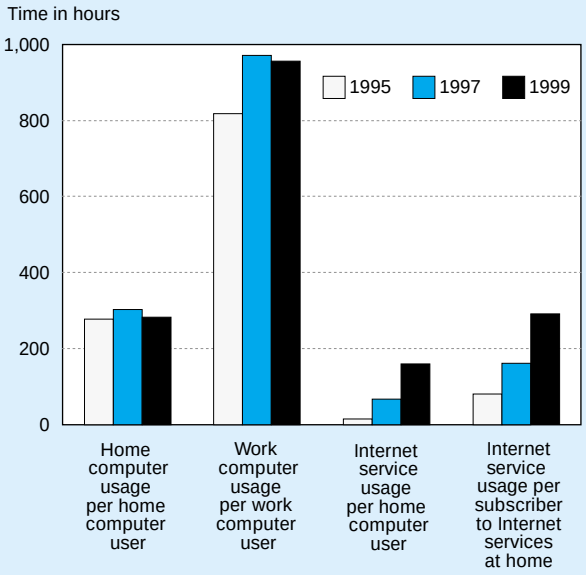
Text table 8-5.
Public's use of home computers, work computers, and the Internet

Variable	1995	1997	1999
Percentage of public with			
Access to a home computer	37	43	54
Access to a computer at work	39	38	42
Subscription to online service at home	7	18	32
Average time spent per year			
On home computer for home computer users in hours	278	302	283
On work computer for work computer users in hours	818	971	957
Average time spent online at home per year in hours			
For the general public	6	29	86
For home computer users	15	67	159
For Internet users	80	161	296

See appendix table 8-32 and previous editions of *Indicators.*

Science & Engineering Indicators – 2000

Figure 8-18.
Computer usage: average hours per year: 1995, 1997, 1999



See text table 8-5.

Science & Engineering Indicators – 2000

Differences in computer access, the so-called "digital divide," are quite visible when level of formal education is taken into account. More than 70 percent of those who lack a high school diploma had no access to a computer either at home or at work in 1999. In contrast, only 30 percent of those who graduated from high school, and only 8 percent of those with at least a bachelor's degree, lacked access. Although access has been rising in all three groups, the pace is significantly slower for those with less formal education,

and what increase there has been is entirely attributable to home computer acquisition, not access in the workplace. As an illustration, in 1983, less than 1 percent of those without high school diplomas had computers in their homes. By 1990, the proportion had grown to 7 percent, and by 1999, it had increased to 22 percent. During the same 16-year period, access to computers at work did not rise above 10 percent. Clearly, there is a difference in computer acquisition between those who did not finish high school and those with more formal education, but there is an even greater disparity in the use of computers in the workplace. (See figure 8-19 and appendix table 8-30.) For more information on this subject, see the section on "Information Technologies and the Citizen" in chapter 9.

The Relationship Between Science and the Media: Communicating with the Public

Most of what most Americans know about science and technology comes from watching television or reading a newspaper. (See sidebar, "Where Americans Get Information about Science and Technology.") Thus, the media serve as a crucial conduit between the science and engineering community and the public at large.

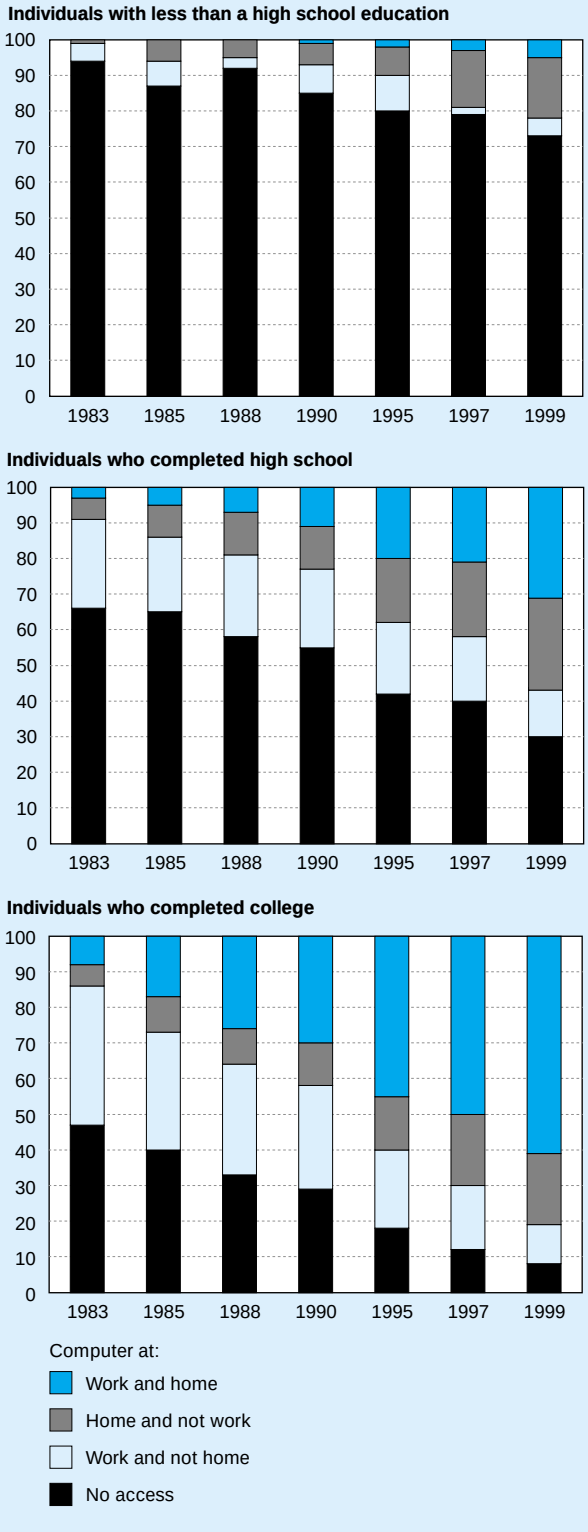
Findings from a recent study conducted by the First Amendment Center[25] revealed a general consensus that the science community and the press are missing opportunities to communicate with each other and with the public:

> [T]he frequent inability of science and the media to communicate effectively with each other seriously undermines science literacy among the general public. This, in turn, creates an electorate ill-prepared to make informed judgments about major issues related to science, health, and technology, such as global warming and human cloning, as well as multi-billion-dollar federal investments in research and development (Hartz and Chappell 1997).

The public needs to be informed about the importance of science and technology, because tax dollars fund a sizable portion of the nation's R&D enterprise—an estimated $66.6 billion in 1998. (See chapter 2, "U.S. and International Research and Development: Funds and Alliances.") The public should know what it is buying with that investment. In addition, the science and engineering community, which relies fairly heavily on public financing for both its employment and its education, is also dependent on the news media to inform the public about the work that it does.

The relationship between the media and the science and engineering community has been the focus of considerable

Figure 8-19.
Access to computers, by level of education: 1983–99 (selected years)



See appendix table 8-30. *Science & Engineering Indicators – 2000*

[25]All information in this section (unless otherwise specified) comes from the report *Worlds Apart: How the Distance between Science and Journalism Threatens America's Future* (Hartz and Chappell 1997). This report contains findings from a study conducted by Jim Hartz (a veteran television and print journalist who has covered science extensively) and Rick Chappell (associate director for science at NASA's Marshall Space Flight Center in Huntsville, Alabama). The Freedom Forum First Amendment Center is affiliated with Vanderbilt University and its Institute for Public Policy Studies.